

What is claimed is:

1. An aqueous polymer composition comprising a plurality of comb copolymer particles:

wherein said comb copolymer particles comprise comb copolymer;

5 wherein said comb copolymer comprises, based on weight of said comb copolymer:

a) from 75 to 98 weight % of a polymer backbone having a glass transition temperature in the range of from -65 °C to 30 °C; and

10 b) from 2 to 25 weight % of at least one graft segment having a glass transition temperature of at least 40 °C attached thereto;

and wherein said comb copolymer comprises as a polymerized unit at least one select monomer selected from the group consisting of aldehyde reactive group-containing monomer; styrenic monomer having at least one ortho-, meta-, or para-alkyl group; and combinations thereof.

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2. The aqueous polymer composition according to claim 1 wherein said polymer backbone comprises as polymerized units from 0.25 to 10 weight % of said aldehyde reactive group-containing monomer, based on the weight of said comb copolymer.

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3. The aqueous polymer composition according to claim 1 wherein said polymer backbone comprises as polymerized units from 0.5 to 20 weight % of said styrenic monomer having at least one ortho-, meta-, or para-alkyl group, based on weight of said comb copolymer.

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4. The aqueous polymer composition according to claim 1 comprising less than 5 weight % volatile organic compounds, based on weight of said aqueous polymer composition.

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5. A process for preparing an aqueous polymer composition comprising particles of comb copolymer, comprising the steps of:

a) providing an aqueous macromonomer emulsion comprising macromonomer dispersed in an aqueous medium, wherein said macromonomer has a glass transition temperature of at least 40 °C;

b) polymerizing said macromonomer in the presence of at least one first ethylenically unsaturated monomer and at least one select monomer selected from the group consisting of aldehyde reactive group-containing monomer, styrenic monomer having at least one ortho-, meta-, or para-alkyl group, and combinations thereof, to provide said particles of said comb copolymer;

wherein said comb copolymer comprises as polymerized units, based on weight of said comb copolymer:

a) from 2 to 25 weight % of said macromonomer; and

b) from 75 to 98 weight % of said at least one first ethylenically unsaturated monomer and said at least one select monomer, wherein a polymer comprising as polymerized units said at least one first ethylenically unsaturated monomer and said at least one select monomer has a glass transition temperature in the range of from -65 °C to 30 °C.

6. An aqueous polymer composition comprising a plurality of comb copolymer particles:

wherein said comb copolymer particles comprise comb copolymer;

wherein said comb copolymer comprises, based on weight of said comb copolymer:

a) from 80 to 99.75 weight % of a polymer backbone having a glass transition temperature in the range of from -65 °C to 40 °C; and

b) from 0.25 to 20 weight % of at least one select graft segment attached thereto;

wherein said select graft segment comprises as polymerized units from 5 to 100 weight % aldehyde reactive group-containing monomer, based on weight of said select graft segment.

7. A process for preparing an aqueous polymer composition comprising particles of comb copolymer, comprising the steps of:

a) providing an aqueous macromonomer emulsion comprising macromonomer dispersed in an aqueous medium, wherein said macromonomer comprises as

5 polymerized units from 5 to 100 weight % aldehyde reactive group-containing monomer, based on weight of said macromonomer;

b) polymerizing said macromonomer in the presence of at least one first ethylenically unsaturated monomer and optionally, at least one select monomer selected from the group consisting of aldehyde reactive group-containing

10 monomer, styrenic monomer having at least one ortho-, meta-, or para-alkyl group, and combinations thereof, to provide said particles of said comb copolymer;

wherein said comb copolymer comprises as polymerized units, based on weight of said comb copolymer:

15 a) from 0.25 to 20 weight % of said macromonomer; and

b) from 80 to 99.75 weight % of said at least one first ethylenically unsaturated monomer and optionally, said at least one select monomer; wherein a polymer comprising said at least one select monomer and optionally, said at least one select monomer, has a glass transition temperature in the range of

20 from -65 °C to 30 °C.

8. A method for forming a coated substrate comprising the steps of:

a) providing an aqueous polymer composition comprising particles of comb copolymer dispersed in an aqueous medium;

25 wherein said comb copolymer comprises, based on weight of said comb copolymer:

i) from 75 to 98 weight % of a polymer backbone having a glass transition temperature in the range of from -65 °C to 30 °C; and

30 ii) from 2 to 25 weight % of at least one graft segment having a glass transition temperature of at least 40 °C attached thereto;

and wherein said comb copolymer comprises as a polymerized unit at least one select monomer selected from the group consisting of aldehyde reactive group-containing monomer; styrenic monomer having at least one ortho-, meta-, or para-alkyl group; and combinations thereof;

5       b) applying said aqueous polymer composition onto a substrate; and

      c) drying or allowing to dry said aqueous polymer composition applied onto said substrate to provide said coated substrate.

9. The method according to claim 8 wherein said aqueous polymer composition  
10       comprises less than 5 weight % volatile organic compounds, based on weight of said aqueous polymer composition.